



DAVINCI
MEDICAL
ACADEMY

SUBJECTS IN NUTSHELL FOR EFFECTIVE REVISION



ANATOMY IN NUTSHELL

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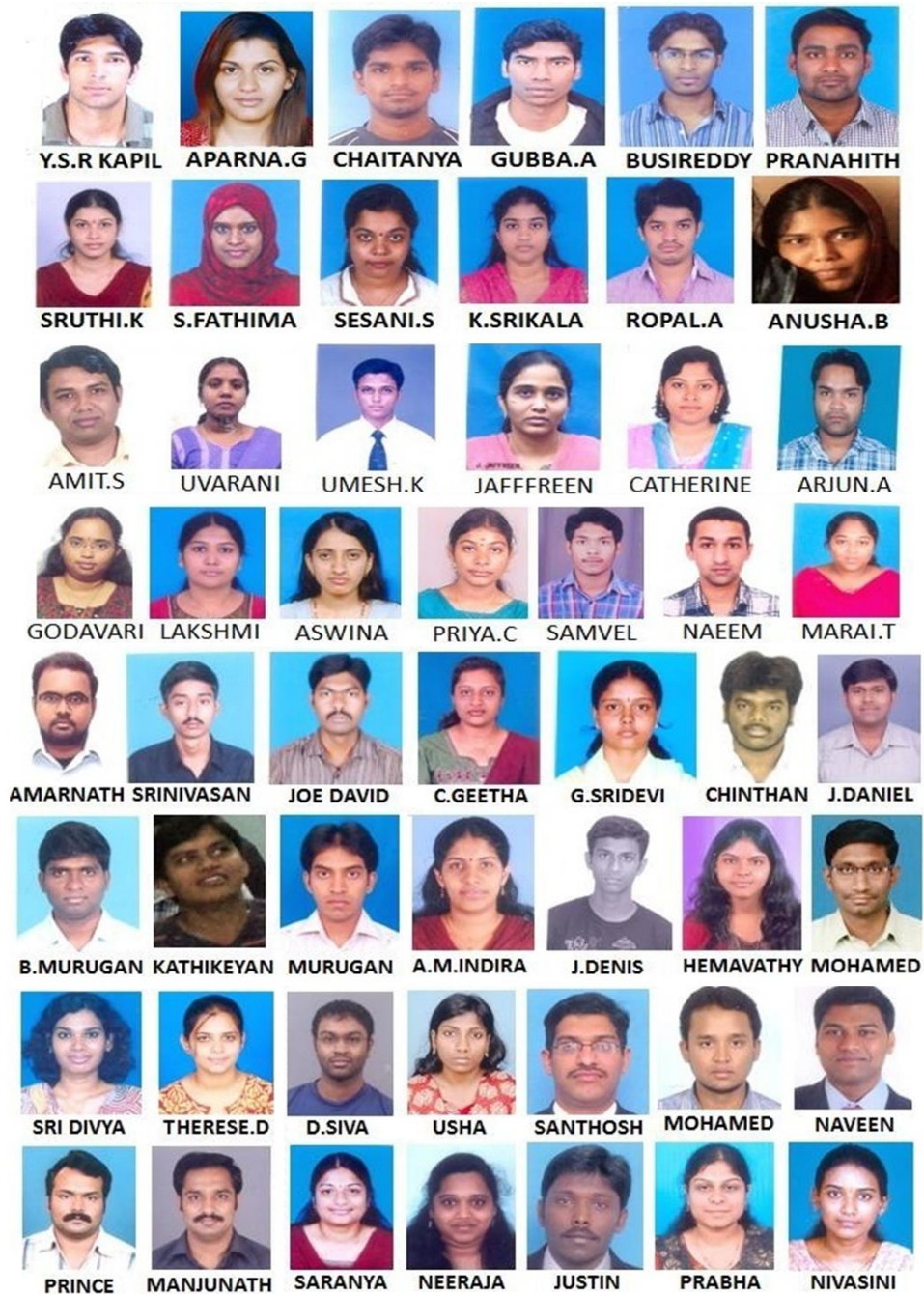
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ELITE TEAM OF FACULTY



SOME OF OUR FMGE TOPPERS



DMA'S CORNER OF WISDOM

THORAX

SUBCLAVIAN ARTERY

- It is the principal artery of the upper limb.
- It is a branch of the brachio - cephalic artery on the right side. On the left side, it is a branch of the arch of the aorta.
- **Branches:**
 - ✓ Vertebral Artery → First & largest branch
 - ✓ Internal thoracic. A
 - ✓ Thyrocervical trunk- Its branches are
 - a. Inferior thyroid. A
 - b. Suprascapular. A
 - c. Transverse cervical. A
 - ✓ Costocervical trunk- the branches are
 - a. Superior Intercostal. A
 - b. Deep cervical. A
 - ✓ Occasionally, dorsal scapular. A

Salient Points:

- Cervical rib may compress the subclavian artery, compressing the radial pulse.
- At times, the right subclavian artery may arise from the descending thoracic aorta. In such case, it passes posterior to the oesophagus which may get compressed and the condition is known as **dysphagia lusoria**.
- **Subclavian artery is divided into 3 parts by scalenus anterior.**

MEDIASTINUM

- It's the central compartment of the thoracic cavity
- contains all of the thoracic visceral organs except lungs
- Its mobile because it contains hollow visceral structures united by loose CT
- each side of the mediastinum is covered by mediastinal surface of the parietal pleura
- **BOUNDARIES:**
 - Anteriorly – sternum;
 - Posteriorly - Vertebral column
 - Superiorly - Thoracic Inlet;
 - Inferiorly - Diaphragm
 - On each sides- Mediastinal Pleura.
- superior mediastinum
 - extends from superior thoracic aperture to the horizontal sternal angle plane
 - extends inferiorly at the level of T4-T5
 - contents- **veins, arteries**, trachea, esophagus, lymphatics, **nerves**
 - veins - Superior vena cava, brachiocephalic, internal jugular
 - arteries- aorta, brachiocephalic trunk (on the right side), carotid, subclavian, internal thoracic (comes off subclavian)
 - nerves- vagus, phrenic, sympathetic chain
 - lymphatics- thymus and thoracic duct
 - muscles- sternohyoid, sternothyroid
- inferior mediastinum
 - extends from the thoracic horizontal plane to the the diaphragm
 - divided into three parts- anterior, middle and posterior.
 - **Anterior** – thymus ,LN, internal thoracic artery and sternopericardial ligament
 - **Middle**- heart,arteries,veins,phrenic nerve and trachea
 - Artery- ascending aorta and pulmonary trunk
 - Vein- SVC and pulmonary vein
 - **Posterior**-vagus nerve, splanchnic nerve, descending aorta,azygos vein, thoracic duct, esophagus

DMA'S CORNER OF WISDOM

Contents of Mediastinum:

Superior Mediastinum	Inferior Mediastinum		
	Anterior Mediastinum	Middle Mediastinum	Posterior Mediastinum
<ul style="list-style-type: none"> • Trachea • Oesophagus • Origins of sternohyoid & sternothyroid • Arteries: <ol style="list-style-type: none"> a. Arch of Aorta b. Brachiocephalic.A c. Lt. common carotid. A d. Left subclavian.A • Veins: <ol style="list-style-type: none"> a. Right & left brachiocephalic.V b. upper half of SVC c. left superior intercostal.V • Nerves: Vagus, Phrenic .N cardiac.N, Left RLN. • Thymus • Thoracic duct 	<ul style="list-style-type: none"> • Sterno - pericardial ligaments • Lymph nodes • Small branches of Internal thoracic. A • Lowest part of thymus • Areolar tissue 	<ul style="list-style-type: none"> • Heart and pericardium • Arteries Ascending Aorta Pulmonary trunk 2 Pulmonary Arteries • Veins: Lower half of SVC Terminal part of Azygos Right & Left Pulmonary veins • Nerves Phrenic.N Deep cardiac plexus • Tracheo bronchial nodes • Bifurcation of trachea 	<ul style="list-style-type: none"> • Oesophagus • Descending Aorta and its branches • Veins Azygos.V Hemiazygos.V Accessory hemiazygos.V • Nerves Vagus Nerve. Splanchnic nerve. • Thoracic duct

LARYNX

- Larynx has 3 unpaired and 3 paired cartilages.
- **Unpaired:** Thyroid, Cricoid, Epiglottis
- **Paired:** Arytenoid, Corniculate, Cuneiform
- **Hyaline Cartilage:** Thyroid, Cricoid, Arytenoid.
- **Fibro-elastic Cartilage:** Epiglottis, Corniculate, Cuneiform and tip of Arytenoids.

Salient Points:

- Thyroid cartilage-largest of all
- Cricoid cartilage-Only cartilage forming a complete ring
- Corniculate-Also called cartilage of Santorini
- Cuneiform-Also called cartilage of Wrisberg.

DIAPHRAGM

- Principal muscle of respiration
- Thin, dome shaped sheet of muscle (skeletal muscle)
- Nerve supply: left & right phrenic nerves (C3-5)
- Separates thoracic & abdominal cavities
- Forms roof of abdominal cavity

OPENINGS OF DIAPHRAGM

Opening	Vertebral level	Portion of Diaphragm	Structures Passing through
Vena caval(V)	T8	Central tendon	Inferior vena cava, Right Phrenic nerve
Oesophageal(O)	T10	Muscular portion of Right crus	Oesophagus, Oesophageal br.of left gastric Artery, Vagus Nerve
Aortic(A)	T12	Aponeurosis between right & lateral crus	Aorta, Thoracic duct, Azygos vein

DMA'S CORNER OF WISDOM

- **Foramen of morgagni/ sternocostal triangles-** small defects in the posterior aspect of the anterior thoracic wall between the sternal and costal attachments of the diaphragm. The internal thoracic vessels descend through these foramina to become the superior epigastric vessels.
- **Structures passing deep to the crus**
 - Right crus- splanchnic nerve
 - Left crus- splanchnic nerve + hemiazygous vein
- **Structures passing deep to the arcuate ligament**
 - Medial-sympathetic chain
 - Lateral- subcostal vessels + nerves
- **Functions of diaphragm**
 - Inspiration – diaphragm contracts and descends
 - Expiration – diaphragm relaxes and ascends
 - Rt crus acts as a sphincter for esophagus as esophagus pierces the rt crus.
- **Origins of the diaphragm:**
 - sternal part (back from xiphoid process)
 - costal part (lower 6 costal cartilages)
 - lumbar part (left & right crus & arcuate ligaments)
- **Insertion**
 - Muscle fibres attach to the central tendon of diaphragm and the anterior fibres are more horizontal. Lateral and posterior fibres are more vertical. Hence domes of diaphragm descend when muscle fibres contract.
- **Sensory supply**
 - **Central** part: sensory fibres travel in phrenic nerve. Pain is referred to left or right shoulder.
 - **Peripheral** part: sensory fibres travel in lower 6th-7th intercostal nerves & subcostal nerve. Pain is felt in distribution of these nerves.
- **Motor supply-** Left & right phrenic nerves (C3,4,5)- supply each hemidiaphragm via the inferior surface.
 - Damage to phrenic nerve leads to Ipsilateral hemidiaphragmatic paralysis
- **Diaphragmatic hernia**
 - Disruption of the continuity of the diaphragm leads to protrusion of the abdominal viscera through the diaphragm into the thoracic cavity is known as diaphragmatic hernia

Diaphragmatic Hernia can be either congenital or acquired

ACQUIRED DIAPHRAGMATIC.H		CONGENITAL DIAPHRAGMATIC HERNIA	
Traumatic.H	Hiatus.H	Retrosternal.H	Posterolateral.H
<ul style="list-style-type: none"> • Always acquired • Usually by bullet injury 	<ul style="list-style-type: none"> • Mostly acquired • Due to weakness of Phreno-Oesophageal membrane- sliding type • May be congenital sometimes (Rolling type) 	<ul style="list-style-type: none"> • Morgagnian Hernia • Occurs through the foramen of Morgagni (space of Larry) • Usually on Right side and anteriorly • M/C viscus involved is transverse colon • Usually asymptomatic 	<ul style="list-style-type: none"> • Bochdalek Hernia • Most common type of congenital pleura - peritoneal hiatus (Bochdalek foramen) • Usually on left side and posterior • Triad of Respiratory distress Apparent dextrocardia scaphoid Abdomen.

- **NOTE-** Kidney and bladder DONOT herniated through the diaphragm

AZYGOS VEIN

- “Azygos” - unpaired
- Azygos.V drains the thoracic wall and upper lumbar region.
- Acts as an important channel connecting the superior and inferior venae cava.
- Occupies the upper part of post abdominal wall
- Posterior Mediastinum.

Formation:

- Formed by the union of Lumbar Azygos.V, Right subcostal.V, & Right ascending lumbar.V

Course:

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DMA'S CORNER OF WISDOM

- Enters the thorax by passing through the aortic opening of the diaphragm
- It then ascends upto 11th thoracic vertebra where it arches forwards over the root of right lung
- Ends by joining the superior vena cava

Tributaries:

- Right superior intercostals vein (Formed by union of 2nd, 3rd and 4th posterior intercostals veins)
- 5th to 11th right posterior intercostals veins
- Hemiazygos.V & Accessory Hemiazygos.V at the level of T8
- Right bronchial. V near the terminal end of Azygos.V
- Several Oesophageal, mediastinal and pericardial veins

BRONCHIAL ARTERY

- Direct branch of descending Aorta
- Supplies bronchial tree as far as respiratory bronchioles & Communicates with the branches of pulmonary. A

CHEST WALL

BONES OF THORAX

- The bones of thorax supports the walls of the pleural cavity and diaphragm and also serves to protect the heart and lungs
- The sternum, 12 pairs of ribs, and 12 thoracic vertebrae forms the bony thorax.
- Note that clavicles are not part of the bony thorax

STERNUM/BREASTBONE

- A narrow, flat bone
- Size- 6 inches long (body=4 inches)
- Supports the clavicles
- Provides attachment to costal cartilages
- 3 parts- the manubrium (most superior and widest part), the body, and the xiphoid process (distal and smallest part)
 - Jugular notch (superior part of manubrium) at the level of T2
 - Angle of Louis (between manubrium and body) at the level of T4
 - Xiphoid process is at the level of T10 vertebra.
- The jugular notch a.k.a. suprasternal notch is the most superior part of the manubrium
- the sternum articulates with the clavicle at the clavicular notch
- the body of the sternum is attached to 5 costal cartilages at the lateral borders

RIBS

<ul style="list-style-type: none">• True ribs= 1-7 (attached to the sternum)• False ribs= 8-12 (11th and 12th are floating ribs)• Each single rib has a Head, a Neck, and a Shaft, and a Tubercle.<ul style="list-style-type: none">○ Head contains a facet for articulation with the body of the vertebrae○ Tubercle contains a facet for articulation with the transverse process of the vertebrae• Muscles attached to 1st rib<ul style="list-style-type: none">○ Scalenus anterior○ Scalenus medius○ Serratus anterior○ Subclavius• Muscles attached to 2nd rib<ul style="list-style-type: none">○ Scalenus posterior• Muscles attached to 12th rib<ul style="list-style-type: none">○ Quadratus lumborum	<ul style="list-style-type: none">• Shortest, broadest & most curved : 1st rib• Typical ribs : 3-9• True ribs/vertebro sternal ribs (Cartilage connected to sternum) : 1-7• Typical Inter Coastal nerves : 4-6• Costal margin formed by : 7-10• Typical vertebrae : 2-8• False ribs/vertebro chondral : 8-12• Floating ribs (vertebral ribs) : 11, 12
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DMA'S CORNER OF WISDOM

THORACIC NERVES

- T1-T11 = Intercostal nerves
- T12 = subcostal nerve

JOINTS OF THE BONY THORAX

- Sternoclavicular- synovial, gliding joint
- Manubriosternal- symphysis (corresponds to the sternal angle)
- Sternocostal- the 1st rib is immovable, 2nd-7th ribs are freely moveable
- Costochondral - Cartilaginous, synchondroses, immovable
- Costovertebral- Synovial, gliding; freely movable
- Costotransverse- Synovial, gliding; freely movable
- Interchondral- The articulation between costal cartilage of the 6th-10th ribs
- Xiphisternal – synchondrosis, Immobile
- Costal cartilage- hyaline cartilage

Muscles helping in respiration

- Primary Muscles of Inhalation
 - Diaphragm
 - External Intercostals
- Accessory Muscles of Inhalation- used in forced inhalation
 - Costal Elevators
 - Serratus posterior superior
 - Pectoralis major
 - Pectoralis minor
 - Subclavius
 - Serratus anterior
 - Sternocleidomastoid
 - Scalenes
- Primary Muscles of Exhalation
 - Rectus Abdominus
 - External obliques
 - Internal obliques
 - Transverse abdominus
- Accessory Muscles of Exhalation- active during forced exhalation
 - Subcostals
 - Internal Intercostals
 - Transverse thoracic
 - Serratus posterior inferior
 - Quadratus lumborum

DMA'S CORNER OF WISDOM

HEART

- **Location-** center of the chest, under the sternum and in between the lungs. 2/3 rds of the heart lies to the left of the sternum.
- Heart pumps about 140ml blood per beat for a total of 5L/minute(cardiac output)
 - Rt. Border is formed by RA + SVC, IVC
 - Inf. Border: by RV + some part of LA
 - Apex: by LV (3.5" Lt. to 5th I.C.S.)
 - Base (post surface): LA>RA (LA Receiving 4 pulmonary veins)
 - Lt. border: LV (mostly) + Lt auricle
 - **NOTE-** In any injury to chest → RV is affected most commonly

STRUCTURE OF THE HEART:

Anterior surface of heart (Sterno costal surface)	Right border	Inferior surface (diaphragmatic surface)	Left heart border
<ul style="list-style-type: none"> • RV mainly • Partly LV and left auricle 	<ul style="list-style-type: none"> • IVC • RA • SVC 	<ul style="list-style-type: none"> • RV+LV 	<ul style="list-style-type: none"> • Aortic knuckle • Pulmonary artery • Left atrial appendage • LV

- LA is not seen anterior as it is covered by the aorta and pulmonary trunk
- Membranous part of atrioventricular part of Inter Ventricular Septum is between RA & LV
- Structures related to base of heart
 - Oesophagus
 - Descending thoracic aorta
 - Rt. Pulmonary vein
- Lymphatics drain into tracheobronchial + Mediastinal LN
- Sympathetic innervation is by T₂-T₆
- In CPR sternum is rhythmically compressed backward for 4-5 cm about 60 times/min.
- Lt. Atrium does not extend to the diaphragmatic surface.
- Orifice of coronary sinus is guarded by thebesian valve while IVC orifice is guarded by rudimentary Eustachian valve (SVC orifice has no valve)
- LA forms post-surface (base) of heart and lies behind RA. Posterior surface of LA forms ant. Wall of oblique sinus of pericardium (which separates LA from Esophagus posteriorly).
- Anterior 2/3rd of interventricular septum is supplied by ascending br. Of LAD artery. While posterior part of IVS is supplied by RCA.
- In 40% cases SA node is supplied by LCA.
- LAD (widow's artery) is also known as anterior interventricular artery is a branch of left coronary artery & is mostly affected by atherosclerosis.
- Kugel's artery, diagonal artery and obtuse marginal artery are branches of LCA
- Posterior descending artery and marginal artery are branches of RCA
- RCA lies in posterior Inter Ventricular groove; LCA lies in anterior Inter ventricular groove.

ARTERIES SUPPLYING THE HEART

	Right Coronary Artery	Left Coronary Artery
Source	From Anterior aortic sinus of ascending aorta	From left Posterior aortic sinus of ascending aorta
Course	<ul style="list-style-type: none"> • Run in Right anterior coronary sulcus, then in Posterior AV groove • Anastomose with LCA in Posterior interventricular groove 	<ul style="list-style-type: none"> • First runs in interventricular groove, runs in anterior coronary sulcus, then in left posterior AV groove

DMA'S CORNER OF WISDOM

Area of distribution	<ul style="list-style-type: none"> • Right Atrium • Ventricular: <ul style="list-style-type: none"> a) Most part of Right ventricle the anterior interventricular groove b) Part of Left ventricle adjoining posterior interventricular groove • Posterior part of interventricular septum • Whole conducting system except: RBB Part of left branch of AV bundle SA node in 35% 	<ul style="list-style-type: none"> • Left Atrium • Ventricular: <ul style="list-style-type: none"> a) Most part of left ventricle except area adjoining the posterior interventricular groove b) Part of Right ventricle adjoining anterior interventricular groove • Anterior part of interventricular septum • Right Bundle Branch, (RBB) Part of left branch of AV bundle, SA Node (35%)
Branch	<ul style="list-style-type: none"> • Acute marginal • Posterior interventricular (descending), in 90% cases • Right conus • Nodal (in 65% cases) • Atrial, Anterior and posterior ventricular. 	<ul style="list-style-type: none"> • Anterior inter ventricular (descending) • Circumflex. A • Left diagonal. A • Obtuse marginal. A • Atrial, Anterior and Posterior ventricular

VEINS OF THE HEART

1. Coronary Sinus:

- Largest vein of the heart situated in the left Posterior coronary sulcus
- Ends by opening into the posterior wall of the right atrium

The tributaries are:

- Great cardiac.V → Enters the left end of coronary sinus
- Middle cardiac V → Joins the middle part of coronary sinus
- Small cardiac.V → Joins the right end of coronary sinus
- Posterior vein of left Ventricle → Ends in middle of coronary sinus
- Oblique.V of left atrium of Marshalls → Terminates in left end of coronary sinus
- [Develops from left common cardinal Vein (duct of curier)]
- Right marginal.V

2. Anterior Cardiac Veins:

- These veins are 3 or 4 small veins which run parallel to each other on the anterior wall of right ventricle
- Opens directly into the right atrium through its anterior wall.

3. Thebesian Veins (Venae Cordis minimi)

- They are the numerous small veins present in all the four chambers.
- Open directly into the cavity of heart.
- The venae Cordis minimi are more numerous on right side (may be the reason why left side infarcts are more common)

○ Development of coronary sinus:

- The sinus venosus can be divided into three parts
 - ✓ Right horn- incorporated into right atrium
 - ✓ Left horn & Body- Give rise to coronary sinus

CONDUCTION SYSTEM OF HEART

1. The sino-atrial (SA) node- at the junction of SVC with RA/ upper end of crista terminalis. Its present anterolaterally
2. The atrio-ventricular (AV) node- at the opening of coronary sinus to RA.
3. The bundle of His
4. The left and right bundle branches
5. The Purkinje fibres

DMA'S CORNER OF WISDOM

3 stages of a single heart beat are:

1. Atrial depolarisation
2. Ventricular depolarisation
3. Atrial and ventricular repolarisation.

Systems that control the heart

1. Autonomic Nervous System
2. Intrinsic Conduction System

ANS Innervation:

1. Sympathetic:
 - fight or flight
 - speeds up heart;
 - affects SA and AV nodes
2. Parasympathetic:
 - rest & digest
 - slows down heart
 - affects Vagus nerve
- **Path of electricity conduction**
 - **SA Node-->AV Node(delay)-->Av Bundle(R and L Bundle Branches in and throughout the septum)-->Purkinje Fibers** which extend into muscular walls of ventricles (which makes the ventricles to contract).
- What causes the delay of conduction in the atrioventricular node?
 - Fewer gap junction which create a greater resistance and small diameter fibers

LUNGS

- **Anatomy of lung:**
 - Right lung is divided into 3 lobes (upper, middle & lower) by two fissures, oblique & horizontal.
 - Left lung is divided into 2 lobes by the oblique fissure.
 -

Structures related to the mediastinal surfaces:

Right lung	Left lung
<ul style="list-style-type: none">● Right atrium & auricle● A small part of the right ventricle● Superior vena cava● Part of (R) brachio cephalic vein● Azygos vein● Oesophagus● Inferior vena cava● Trachea● Right vagus nerve● Right phrenic nerve	<ul style="list-style-type: none">● Left ventricle & auricle, infundibulum & adjoining part of right ventricle.● Pulmonary trunk● Arch of aorta & Descending thoracic aorta● Left subclavian artery● Thoracic duct● Oesophagus● Left brachiocephalic vein● Left vagus nerve & Left phrenic nerve● Left recurrent laryngeal nerve

- **Root of the lung:**
 - Connects the medial surface of the lung with the mediastinum.
 - Contents:
 - Principal bronchus on the left side, eparterial & hyparterial bronchi on the right side,
 - One pulmonary artery
 - Two pulmonary veins- superior & inferior
 - Bronchial arteries, one on the right side, two on the left.
 - Bronchial veins
 - Anterior & posterior pulmonary plexus of nerves
 - Lymphatics of the lungs
 - Broncho pulmonary lymph nodes
 - Areolar tissue.

DMA'S CORNER OF WISDOM

- **Arrangement of structures in the root:**
 - **FROM BEFORE BACKWARDS: (similar on both sides)**
 - ✓ Superior pulmonary vein
 - ✓ Pulmonary artery
 - ✓ Bronchus
 - **FROM ABOVE DOWNWARDS**

RIGHT SIDE	LEFT SIDE
Eparterial bronchus Pulmonary artery Hyparterial Bronchus Inferior pulmonary vein	Pulmonary artery Bronchus Inferior pulmonary vein

Relations of the root:

Anterior	Posterior	Superior	Inferior
Common on both sides: <ul style="list-style-type: none"> - Phrenic nerve - Pericardio phrenic vessels - Anterior pulmonary plexus On the right side: <ul style="list-style-type: none"> - Superior vena cava - Part of right atrium 	Common on both sides: <ul style="list-style-type: none"> - Vagus nerve - Posterior pulmonary plexus On the left side: <ul style="list-style-type: none"> - Descending thoracic aorta 	On the right side: Terminal part of azygos vein On the left side: Arch of aorta	Pulmonary ligament

Differences between right & left lungs:

Right lung	Left lung
- 2 fissures & 3 lobes	- Only one fissure & 2 lobes
- Anterior border is straight	- Anterior border interrupted by cardiac notch
- Larger & heavier (700g)	- Smaller & lighter (600g)
- Shorter & broader	- Longer & narrower

Pleura

- two thin layers of tissue that protect and cushions the lungs.
- Divided into parietal and visceral pleura
 - Parietal pleura is sensitive to pain whereas viscera pleura isn't.
 - Parietal pleura lines the thoracic wall, diaphragm and mediastinum
 - Visceral pleura adheres to pulmonary surfaces and interlobar fissures of lung
 - Costal Pleura- Lines Thoracic wall
 - Mediastinal Pleura- Covers lateral aspect of mediastinum (continuous with visceral pleura)
 - Diaphragmatic pleura- Covers superior surface
- Pleural cavity- it's a potential space between parietal and visceral pleura. It extends at midaxillary line to form **costo diaphragmatic recesses** (earliest site for pleural effusion)
- Mediastinum, right and left pleural cavities are the three large spaces in thoracic cavity of diaphragm

MAMMARY GLAND

- Breast contains 20-25 lobes which are separated by Cooper's suspensory ligament which travels between the deep fascia, which connects the breast to the muscle, to the skin
- The lobes consist of lobules made up of alveoli which converge to form ductules. Ductules from each lobule converge to form the lactiferous duct which leaves each lobe. Each breast has 15-20 lobules. Lactiferous ducts drain the lobules and they drain into the nipple.
- Each lactiferous duct opens onto the nipple, proximal to the opening there is a widening called the lactiferous sinus
- Thin, pigmented skin surrounding the nipple is called the areola. It contains modified sebaceous glands (Montgomery glands) and smooth muscle.
- **Margins of the breast base**
 - Medially - sternal margin
 - Laterally - midaxillary line from the 2-6th intercostal space.

DMA'S CORNER OF WISDOM

- The grainy appearance of nipple is because of the sebaceous glands.
- **Breast location**
 - Extend over ribs 2-6
 - Lateral to sternum
 - As far as the midaxillary line
 - Over fascia of pectoralis major/serratus anterior
- Breast is divided into 4 quadrants for the purpose of examination
- Average nipple size= 12-15mm
- 3 tissue types
 - Glandular
 - Fatty
 - Connective/fibrous
- The upper quadrant of the breast which extends laterally into the axilla comprises the tail of Spence/axillary tail
- Arteries supply the lateral mammary gland
 - Lateral thoracic
 - Posterior intercostals
- Arteries supply the medial mammary gland
 - Internal thoracic
 - Anterior intercostal
- Mostly T4-T6 intercostal nerves innervates the breast
- **Muscles in close proximity to the breast**
 - Pectoralis major, minor, serratus anterior, and latissimus dorsi.
- 3 "S"s for breast assesment= shape, size, symmetry
- Mammogenesis- development of mammary tissue and related structures
- Lactogenesis I-
 - Starts from 16-20 weeks of pregnancy
 - Beginning of secretory cellular activity
 - Accumulation of colostrum (from 10-12 weeks)
- Lactogenesis II
 - Triggered by the delivery of the placenta it starts 30-72 hours after placental delivery
- Breasts are capable of full lactation from 16 weeks of pregnancy
- 5 milk synthesis pathways
 - Pathway 1= protein secretion
 - Pathway 2= lactose secretion
 - Pathway 3= milk fat synthesis
 - Pathway 4= monovalent ion secretion
 - Pathway 5= plasma protein secretion
- calories in mature breast milk
 - 21 kcal/oz.
 - 75 kcal/dl.
- ratio glandular:fat tissue in breast= **2:1**
- 65% of glandular tissues is found within 30mm of nipple
- **myoepithelial cells**- encases alveolus and contracts in response to oxytocin- MER
- most important intercostal nerves
 - **4th**- runs from deep to superficial
 - -divides into 5 branches
 - -lateral branch most important
 - -located at 5 and 7 o'clock
 - also **5th and 6th**
- **poland syndrome**
 - -congenital problem
 - -under development of breasts
- Lymph nodes do the lateral and medial mammary glands drain to
 - Lateral --> axillary
 - Medial --> parasternal
- From the breast the lymph drains into
 - subcutaneous subareolar plexus
 - submammary plexus on pectoralis major
- Lactogenesis III
 - Switch from endocrine to autocrine control
 - Onset of copious milk production
 - Also known as galactopoesis
 - Day 9 of involution

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